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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,915	05/11/2006	Shozaburo Konishi	04703/0203963-US0	4217

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EXAMINER	
VASISTH, VISHAL V	
ART UNIT	PAPER NUMBER
1797	
MAIL DATE	DELIVERY MODE
10/07/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/566,915	KONISHI ET AL.	
	Examiner	Art Unit	
	VISHAL VASISTH	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :3/3/2006,3/23/2006 and 6/20/2006.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 4-6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tinney, US Patent No. 6,543,394 (hereinafter referred to as Tinney) as evidenced by Clark et al., US Patent Application Publication No. 2005/0241216 (hereinafter referred to as Clark).

Regarding claims 1 and 4-6, Tinney discloses a fuel lubricated, Internal combustion engine (as recited in claim 4) system and method of feeding fuel to the combustion system (as recited in claim 5) (Claim 35 and 36 of Tinney) which includes a fuel tank containing at a remote location from the engine, a first fluid path for transporting fuel to the lubrication system of the engine, and a second fluid path for transporting fuel to said combustion system of the engine. In this way, the engine's fuel

serves as the lubricant and the combustive agent. Certain load bearing surfaces of the engine can include a hard material such as a diamond-like coating. The fuel can be any of, liquefied petroleum gas, bio-diesel, natural gas, biogas, methanol, Fischer-Tropsch fuel (hydrocracked mineral oil of claim 1 and lubricant of claim 6) and several others (see Abstract). The fuel has a viscosity in the range of about 1.5 to 4.5 centistrokes (overlaps with the range including kinematic viscosity of 2 to 20 mm^2/s at 100°C as recited in component (a) of claims 1, 5-6). Tinney does not disclose the aromatic content or the sulfur content of the base oil, but Clark discloses that by virtue of the Fischer-Tropsch process, a Fischer-Tropsch derived gas oil has essentially no, or undetectable levels of sulfur (overlaps with sulfur content of not higher than 0.005 mass% as recited in component (a) of claims 1, 5-6). And the aromatic content of a Fischer-Tropsch derived gas oil will more preferably be below 0.1 wt% (which overlaps with aromatic content of not higher than 5 mass% as recited in component (a) of claims 1, 5-6) (Para. [0017]).

The Tinney reference only mentions that zinc dialkyldithiophosphates can be added and are thus optional and there are no other sulfur containing additives in the lubricant system thus there is less than 0.2 mass% of sulfur in the lubricant system (as recited in component (b) of claims 1, 5-6). No sulfur containing additives means that the lubricant is free of sulfur-containing metal detergents (as recited in claim 9).

Claim Rejections - 35 USC § 103

4. Claims 2-3 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tinney, in view of Yagishita, US Patent Application Publication No. 2005/0272616 (hereinafter referred to as Yagishita).

Regarding claims 2-3 and 7-8, Tinney discloses all of the limitations as applied to claims 1, 4-6 and 9 above and discloses the use of additives that improve lubricity and clean engine components (Col. 2/L. 37-42), but Tinney does not explicitly disclose a sulfur-free metal detergent/a sulfur-free ashless anti-oxidant or oxygen-containing/aliphatic amine friction modifiers.

Yagishita discloses a low sulfur lubricant composition for use in an internal combustion engine wherein the base oil can be derived from hydrocracking and produced by isomerizing GTL wax (Para. [0020]). The composition further comprises a alkaline earth metal salicylate (sulfur-free metal detergent as recited in claims 2 and 7) (Para. [0028]), antioxidants such as dialkyldiphenylamine (sulfur-free ashless anti-oxidant as recited in claims 2 and 7) and friction modifiers which include aliphatic amines (aliphatic amine friction modifier as recited in claims 3 and 8) (Para. [0061]). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tinney with the additives of Yagishita in order to enhance the anti-corrosive properties of the lubricant.

Claim Rejections - 35 USC § 103

5. Claims 1-4 and 6-8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirahama et al., US Patent Application Publication No. 2003/0162672 (hereinafter referred to as Shirahama).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Regarding claims 1-4 and 6-8, Shirahama discloses a low-friction sliding mechanism comprising first and second sliding members slidable relative to each other and a lubricant being applied to the sliding surfaces of the sliding members (see Abstract). The first sliding member is made of a diamond-like carbon material.

Shirahama discloses the use of a lubricant between the sliding members, wherein the lubricant can be a synthetic lubricant preferably a polyalphaolefin wherein the base oil has an aromatic content of preferably 8% or less, a kinematic viscosity of preferably between 2 and 20 mm^2/s, and although the sulfur content of the base oil is

not mentioned, it would be obvious to one of ordinary skill in the art at the time of the invention that the sulfur content would be below 0.005 mass%. Shirahama does not disclose the sulfur content of the lubricant composition but since only the optional use of a sulphonated detergent and preferably 0.06% or less of ZDDP are used in the composition, the lubricant composition would have a sulfur content of not higher than 0.2 mass%. Shirahama further discloses antioxidants such as alkyldiphenylamine (Para. [0042]), friction modifiers such as aliphatic amines (Para. [0025]). The finished lubricant of Shirahama is suitable for use in an internal combustion engine (Para. [0020].

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1-8 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2, 4-6, 8-10, 12 and 14 of copending Application No. 10/567,311. Although the conflicting claims are not identical, they are not patentably distinct from each other because they appear to comprise overlapping subject matter. The co-pending application claims a system having a DLC contact surface and two or more sliding parts relative to each other wherein there is a lubricant having a specified kinematic viscosity, aromatic content, and sulfur content between the two opposed surfaces. Further additives claimed are a sulfur-containing molybdenum complex, metal detergents, aliphatic amine friction modifiers wherein the total sulfur content can not exceed a prescribed level. The instant claims recite the same system, method and lubricant with the same additives, and base oil, but do not specify a sulfur-containing molybdenum complex. This, however, would have been obvious to one preparing a system for use in an internal combustion engine especially with the specified sulfur levels for the lubricant composition.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Mastro et al., US Patent No. 6,508,416 (hereinafter referred to as Mastro).

Mastro teaches a coated fuel injector, wherein the wear surfaces are coated with DLC, and the injector has slidable parts relative to each other. Also, the valve is coated with a lubricant (fuel) which can be alcohol containing.

8. There were unused X references that were obtained from the search report. The references above disclose all of the claimed elements.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VISHAL VASISTH whose telephone number is (571)270-3716. The examiner can normally be reached on M-R 8:30a-5:30p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571)272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ellen M McAvoy/

Primary Examiner, Art Unit 1797

VVV